
# Multidisciplinary Evaluation of Noncardiac Chest Pain

# Nonkardiyak Göğüs Ağrılarının Multidisipliner Değerlendirilmesi

Nonkardiyak Göğüs Ağrısı / Noncardiac Chest Pain

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**Özet**

Amaç: Biz bu çalışma ile nonkardiyak göğüs ağrılarının sebeplerini, klinik değerlendirmesini ve tedavi seçeneklerini sunmayı amaçladık. Gereç ve Yöntem: Toplam 40 nonkardiyak göğüs ağrılı hasta değerlendirildi ve tedavi edildi. Olgular öncelikle anjina benzeri göğüs ağrısı ile kardiyoloji kliniğine başvurdular, myokard perfüzyon sintigrafisi ve koroner anjiyografi ile değerlendirildiler ve sonra fizik tedavi, psikiyatri, gastroenteroloji ve göğüs hastalıkları kliniklerine konsülte edildiler. Bulgular: Hastaların yaş ortalaması 41,35 ± 12,20 yıl (18-70 yaş), on iki'si (% 30) erkek, 28'i (% 70) kadın idi. Kas iskelet hastalıkları 9 (%22.5) olgu, emosyonel bozukluk 8 (%20) olgu, özofageal hastalık 14 (% 35) olgu ve göğüs hastalıkları 9 (%22.5) olgu şeklinde tespit edildi. Sonuç: Nonkardiyak göğüs ağrıları klinik uygulamada yaygın, pahalı, zor ve her zaman iyi huylu olmayan bir problemdir. Etyolojik faktörler kas iskelet, emosyonel, özofageal ve göğüs hastalıklarını ilgilendirebilir. Dikkatli değerlendirme, erken tanı ve uygun tedavi yaklaşımı sahip olduğu yüksek maliyet ve hayatı tehdit edici etyolojiler içermesi nedeniyle önemlidir.

**Anahtar Kelimeler**

Kardiyak; Ağrı, Göğüs; Kas-İskelet; Özofageal; Emosyonel

**Abstract**

Aim: We aimed the report the reasons, clinical evaluation, and treatment options of noncardiac chest pain. Material and Method: A total 40 noncardiac chest pain patients had been evaluated and treated. They were applied with angina like chest pain to cardiac clinic firstly, the patients were evaluated with myocard perfusion scintigraphy or coronary angiography, and then all of the patients consulted with musculoskeletal, emotional, esophageal and chest diseases clinics. Results: The mean age of the patients was 41.35±12.20 years (18-70 years), twelve (30%) were male and 28 (70%) were female. Musculoskeletal diseases were observed 9 (22.5%) patients, emotional diseases were observed 8 (20%) patients, esophageal diseases were observed 14 (35%) patients and chest diseases were observed 9 (22.5%) patients. Discussion: Noncardiac Chest Pain is a common, expensive, not always benign and difficult problem in clinical practice. The etiologies should be include musculoskeletal, emotional, esophageal and chest diseases. Carefully evaluation, early diagnosis and appropriate treatment approaches are important because of the high costs and contains the seriously life threating causes.

**Keywords**

Cardiac; Pain, Chest; Musculoskeletal; Esophageal; Emotional

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## Introduction

Chest pain is one of the reason in the acute care unıt and it is different cardiac from noncardiac [1]. Noncardiac chest pain, described a chest pain in patients with angiographically normal coronary arteries [2], and includes gastroesophageal, pulmonary, musculoskeletal, dermatological and emotional diseases [1, 3]. Heart disease is the primary reason of death in United States [1, 4], that is why it is important to diagnose a cardiac etiology in patient with acute chest pain. On the other hand noncardiac chest pain reasons may be serious. In about 10 to 30% of patients undergoing coronary angiography for evaluation of chest pain, and coronary arteries are found in normal [5]. Noncardiac chest pain is a very common disorder and frequency in the United States is 23% of the population [6, 7].

Noncardiac chest pain carries a well prognosis, these patients have frequently office visits, emergency room evaluations, hospital admissions and repeat catheterizations for their unexplained pain, it is approximatelly an annual health care cost of $750 million [2].

In conclusion we aimed the report the reasons, clinical presentation, evaluation, and treatment approaches of noncardiac chest pain with angiographically and myocard perfusion scintigraphy normal coronary arteries patients.

## Material and Method

A total 40 non cardiac chest pain patients had been evaluated and treated between January 2010 and June 2010. Patients' demographic data, including age, gender, clinical presentation and diagnosis of chest pain were collected. All of the patients were applied with angina like chest pain to cardiac clinic firstly, they had effort dyspnea and electrocardiographic changes, that is why they were evaluated with myocard perfusion scintigraphy or coronary angiography. If the patients cardiac evaluations were normal, in this clinical situation called noncardiac chest pain. All of the patients consulted to the musculoskeletal, emotional, esophageal and chest diseases clinics when cardiac diseases excluded, and stopped the consultation when reached the diagnosis. The patients had treated with medical or medical plus surgical treatment approaches.

Patients gave written informed consent to participate, and the ethics committee was waived because this was a clinical diagnostic and management study. We've just consulted the patients in different clinics, and when we reached the diagnosis, passed the appropriate treatment.

## Results

The mean age of the patients was 41.35±12.20 years (18-70 years), twelve (30%) of the patients were male and 28 (70%) were female, duration of the symptoms were ten days to six months. Twenty-five (62.5%) patients evaluated with coronary angiography, 15 (37.5%) patients were evaluated with myocard perfusion scintigraphy for exclude the cardiac diseases. All off the patients found to have normal coronary arteries. According to the other clinics consultation; myalgia (n:3, 7.5%), fibromyalgia (n:3, 7.5%), Tietze's syndrome (n:2, 5%) and osteoporosis (n:1, 2.5%) were diagnosid within musculoskeletal diseases. Anxiety (n:5, 12.5%) and panic attack (n:3, 7.5%) were diagnosid within emotional diseases. Esophagitis (n:14, 35%) were diagnosid within esophageal diseases. Chest wall mass (n:1, 2.5%), spontaneous pneumothorax (n:2, 5%), lung cyst hydatid (n:1, 2.5%), lung tumor (n:1, 2.5%) thoracic outlet syndrome (n:1, 2.5%) mesothelioma (n:1, 2.5%), parapneumonic pleural effusion (n:1, 2.5%) and pulmonary embolism (n:1, 2.5%) were diagnosid within chest diseases. All of the patients with musculoskeletal, emotional and esophageal diseases were treated with only medical advice, but chest diseases treated with surgical or surgical plus medical approaches (Table 1).

Musculoskeletal, esophageal and chest diseases patients didn't appiled to the hospital with anginal chest pain within nine months following after treatment, but two patients with anxiety, applied to the emergency department with chest pain only one.

Table 1. Clinical evaluation of the patients.

| | | Diagnosis | n | % | Treatment approaches |
|---|---|---|---|---|---|
| **Age** | (18-70) (41.35 ± 12.20) | | | | |
| **Gender** | Female | | 28 | 70 | |
| | Male | | 12 | 30 | |
| | | Myalgia | 3 | 7.5 | |
| **Musculoskeletal** | | Tietze's syndrome | 2 | 5 | |
| (n:9, 22.5%) | | Fibromyalgia | 3 | 7.5 | Medical |
| | | Osteoporosis | 1 | 2.5 | |
| **Emotional** | | Anxiety | 5 | 12.5 | Medical |
| (n:8, 20%) | | Panic attack | 3 | 7.5 | |
| **Esophageal** | | Esophagitis | 14 | 35 | Medical |
| (n:14, 35%) | | | | | |
| | | Chest wall mass (Lipoma) | 1 | 2.5 | Mass resection |
| | | Spontaneous pneumothorax | 2 | 5 | Tube thoracostomy |
| | | Lung cyst hydatid | 1 | 2.5 | Cystotomy + Capitonage |
| | | Lung tumor (Squamous cell carcinom) | 1 | 2.5 | Left upper lobectomy |
| | | Thoracic outlet syndrome | 1 | 2.5 | Servical and first rib resection |
| **Chest** | | Local mesothelioma | 1 | 2.5 | Left lower lobectomy + Chemotherapy |
| (n:9, 22.5%) | | | | | |
| | | Parapneumonic pleural effusion | 1 | 2.5 | Tube thoracostomy + Medical |
| | | Pulmonary embolism | 1 | 2.5 | Medical |

## Discussion

Atypical chest pain which is not due to heart disease is a very common cause for consultation in the cardiac clinic, in the coronary care unit and in the emergency department [8]. Pope et al report that half or more of the patients visiting emergency departments because of the chest pain are found to have noncardiac chest pain [3, 9]. Determination the reason of noncardiac chest pain is a difficult problem in clinical practice, and the most common causes are psychiatric, esophageal and musculoskeletal pathologies [5].

The ECG is a standard, simple, useful and available diagnostic test of the patient with anginal chest pain. A history of prolonged retrosternal and oppressing pain in combination with ST segment elevation on the ECG will suggest the diagnosis of a myocardial infarction, but ST segment elevation and tall T waves do not always mean myocardial ischemia [10]. Pulmonary embolism is a potentially fatal disorder, and some electrocardiographic changes may be seen like right axis deviation, left axis deviation, ST segment elevation, precordial T wave inversion [10]. Gastroesophageal reflux is a more important reason of angina like pain, acid installation in the esophagus may start myocardial ischemia and electrocardiographic changes [10]. T wave and ST segment changes may be misleading of myocardial ischemia [10]. ST segment elevation, decreased QRS amplitude and precorial T wave inversion were reported patients with right and left pneumothorx [11]. The patients with musculoskeletal chest pain may admit to hospital with suspected myocardial infarction [12]. In our study all of the patients had effort dyspnea and electrocardiographic changes, that is why they were evaluated with myocard perfusion scintigraphy or coronary angiography.

Gastroesophageal reflux disease has been shown 60% of noncardiac chest pain [5, 13], psycological disorders are often not

to be noticed because of somatic symptoms, and evaluation for emotional disorders occurs late in the course of the illness [5, 14], musculoskeletal disorders were found 15% with previous studies [5, 15]. Other causes such as pneumonia, pulmonary embolism and pneumothorax are often serious pain, and these conditions present spesific symptoms [3].

Gastroesophageal reflux diseases is usually associated with chest pain during rest or a change in position [3]. The gastroesophageal causes of acute chest pain include esophageal perforation, esophageal spasm, reflux esophagitis, peptic ulcer, pancreatitis and cholecystitis [1]. Endoscopy infrequently detects reflux esophagitis, Sarkar S et al. found that 38% of patients a normal endoscopy [16, 17]. High dose proton pump inhibitor for four weeks in patients with noncardiac chest pain without any symptoms is very effective [16], so it is show that high dose proton pump inhibitor treatment provide decrease need for invasive diagnostic tests and costs. [16]. In our study, esophageal pathologies were observed the most frequently with 14 (35%) patients and all of the patients were esophagitis. All of our patients treatment with proton pump inhibitor.

Continuous pain for over 12 h and the presence of chest wall tenderness are powerful clinical indications of a musculoskeletal cause [12]. Musculoskeletal causes of chest pain are described acute, sharp and stabbing [18]. Generally there is no any obvious precipitating reason [18]. Musculosceletal causes of acute chest pain include costochondritis, rib fracture and myalgia [1]. Costochondritis is the most common [18], and caused by inflammation of the costochondral junction is called Tietze's syndrome [1, 18]. Therapeutic modalities have also been used with benefit, including local steroid injections, physiotherapy, non-steroidal anti-inflammatory drugs and sulphasalazine treatment [12]. In our study, musculoskeletal pathologies were observed with 9 (22.5%) patients and they were include myalgia with 3 patients (7.5%), Tietze's syndrome with 2 patients (5%), fibromyalgia with 3 patients (7.5%) and osteoporosis with 1 patient (2.5%), and all of the patients treatment with medical advise.

Several studies have examined the prevalence of psychiatric disorders include noncardiac chest pain patients, and the prevalence of panic disorder (24–70%), generalized anxiety disorder (33–50%) and major depressive disorder (11–22%) [19]. Patients with anxiety and panic attacks often experience chest pain and present to hospital feared about their health [18]. These patients presenting with chest pain, young age, female, atypical symptoms and another psychiatric disorders [18]. Panic attacks are often include somatic symptoms, like sweating, dizziness, palpitation, paraesthesia, dyspnoea and chest pain [18]. In our study, emotional diseases were observed with 8 (20%) patients and they were include panic attack with 3 patients (7.5%) and anxiety with 5 patients (12.5%), and all of the patients treatment with medical advise, but two patients with anxiety, applied to the emergency department with chest pain only one within nine months following.

Chest pain were described with pulmonary diseases. Pleuritic chest pain is typically sharp, unilateral and results from acute pleural inflammation [1]. Pleuritis generally is caused by lower respiratory infections. Another pulmonary reasons of acute chest pains are include spontaneous pneumothorax, pulmonary embolism, pneumonitis, bronchitis, mesothelioma and chest wall tumor [1, 20, 21].

Pulmonary embolism is suggested by the acute start of dyspnea, pleuritic chest pain, severe hypoxia and risk factors like recent surgery, underlying malignancy and bedfast or sedentary status [1]. Venous thromboembolism of the lower extremity is most common risk factor for pulmonary embolism [1]. Pleuritic pain (66%) is a serious clinical symptoms [1], physical signs are crackles on lung auscultation and tachycardia [1].

Some causes of noncardiac chest pain may need surgical approach such as spontaneous pneumothorax, chest wall and intrathoracic tumors. In our study, 8 (20%). patients underwent surgical intervention. These pathologies were include chest wall mass, lung cyst hydatid, spontaneous pneumothorax, thoracic outlet syndrome, lung tumor, parapneumonic pleural effusion and mesothelioma, that is why our study was also important because of these surgical and some life threating reasons.

Collapse of one or both lungs, caused by accumulation of gas or air in the pleural cavity resulting from injury or diseas is definition of pneumothorax. Spontaneous pneumothorax classified primary and secondary. Primary spontaneous pneumothorax usually occurs with young people who are healthy. Most common pathology is the rupture of an apical subpleural bleb [22]. Secondary spontaneous pneumothorax is associated with people who have lung disease, the most common cause is chronic obstructive pulmonary disease, metabolical diseases, malignancies and infections diseases [22]. The disease is clinically silent, unless one of the blebs ruptures and causes a pneumothorax. An asthenic body, being taller and thinner than the average person with suddenly chest pain and shortness of breath is typical person of spontaneous pneumothorax. The chest pain is first and most common symptom, because of the rupture of an apical bleb, causing the air leak, releases irritant material into the pleural cavity, eosinophilic infiltration and stimulating inflammation of the parietal pleura [22]. Therapeutic options of spontaneous pneumothorax is variations, it is include the conservative, intermediate and invasive procedures [22].

Pleural mesothelioma is a rare tumor, the diagnosis is difficult and include to few treatment process [20]. Chest pain and dyspnea are the most common symptoms [20]. The treatment processes are include chemotherapy, radiotherapy and surgery [20]. Chest diseases may be cause to the chest pain with infiltration, irritation and/or inflamation to parietal pleura, chest wall muscles and nerves. In our study, we performed the medical, surgical and surgical plus medical treatment approaches to all chest diseases, these patients admitted with anginal chest pain to the cardiac clinic firstly, and they were evaluated with coronary angiography or myocard perfusion scintigraphy.

*Conclusion*

Chest pain is one of the most common complaints in acute care unit, differentiating cardiac from noncardiac etiologies is important. Noncardiac Chest Pain is a common, expensive, not always benign and difficult problem in clinical practice. The patients are use the health care system often, but they always dissatisfaction. The etiologies should be include musculoskeletal, emotional, esophageal and chest diseases. Especially pulmonary diseases should be life threating. Carefully evaluation, early diagnosis and appropriate treatment approaches are important because of the high costs and contains the seriously life threating causes.

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